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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,562	03/23/2001	Reiko Kondo	0941.65367	7473

24978 7590 07/13/2005

GREER, BURNS & CRAIN
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EXAMINER

CAO, ALLEN T

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,562

Applicant(s)

KONDO, REIKO

Examiner

Allen T. Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al (US. 6,490,139 B1) in view of Yuasa et al (US. 6,710,984 B1).

Hayashi et al discloses a magnetic head, comprising: a magneto-resistive film having a magnetic free layer 26 at a top part thereof, said magnetic free layer changing a magnetization thereof in response to an external magnetic field (column 7, lines 54-56); first and second magnetic domain control patterns (bias layers 27, 27 act as domain magnetic layers) provided on the magnetic free layer (figure 3A), each of said first and second magnetic domain control patterns magnetic domain control patterns causing a pinning of magnetization in said ferromagnetic free layer in the vicinity thereof (column 7, lines 61-64); a first electrode 29 provided on said magnetic free layer in contact therewith at a region located between said first and second magnetic domain control patterns (figure 3A); and a second electrode 22 provided in electrical contact with a bottom surface of said magneto-resistive film. Hayashi et al also inherently discloses that the magnetic head as set forth is a CPP type magnetic head, because it has the top electrode 29 and the bottom electrode 22; therefore, the current flows from top to the bottom of the MR film, thus the current is perpendicular to the medium, all as set forth in claims 1 and 5. Regarding claim 5, Hayashi et al further discloses a magnetic disk apparatus having a rotary magnetic disk 12; a magnetic head 14.

Hayashi et al, however, does not disclose that the free layer is made of a ferromagnetic material. Hayashi et al only discloses that the free layer is made of a magnetic material.

Yuasa et al discloses a MR film having a free layer 41 on top thereof; domain control layers (43, 43) located on the free layer; electrodes (45, 45) located on the domain control layers and contacted to the free layer at the region between two domain control layers (see figure 4). Yuasa et al also discloses that this film structure can be applied to a CPP MR element (column 20, lines 26-36). Yuasa et al also discloses that the free layer is made of a ferromagnetic material as recited in claims 1 and 5.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the free layer of Hayashi et al with a ferromagnetic material instead of a magnetic material as set forth, supra as taught by Yuasa et al.

The rationale is as follows: One of ordinary skill in the art would have been motivated to make the free layer of Hayashi et al with a ferromagnetic material instead of a magnetic material as set forth, supra as taught by Yuasa et al to improve the magnetization characteristics of the free layer (ferromagnetic material has greater magnetization characteristics than magnetic material), thus improve read/write characteristics of the head.

Regarding claim 2, Hayashi et al discloses a first insulating film 27 (left hand side) covering the first magnetic domain control pattern and a second insulating film 27 (right hand side) covering the second magnetic domain control pattern, such that the first insulating film is interposed between the first magnetic domain control pattern and

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the first electrode and such that the second insulating film is interposed between the second magnetic domain control pattern and the first electrode (figure 3A).

Regarding claim 3, Hayashi et al discloses that the first and the second insulating films have a generally identical thickness.

3. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuasa et al (US. 6,710,984 B1).

Yuasa et al, figure 4 particularly, discloses a magnetic head having a magneto-resistive film; a pair of magnetic domain control patterns (43, 43) provided at both lateral sides of the magneto-resistive film, each of the magnetic domain control patterns causing a pinning of magnetization in the magneto-resistive film in the vicinity thereof (see column 9, lines 1-16; column 9, line 66 to column 10, line 4; and column 10, lines 29-36; etc...); a pair of electrodes (45, 45) provided respectively on the pair of magnetic domain control regions with a mutual separation from each other, each electrode having a tip-end part extending over said magneto-resistive film toward the other electrode, wherein each tip-end part extends beyond said domain control region, on which said electrode having said tip-end part is provided (figure 4).

Yuasa et al, however, does not disclose that the protruding distance is of 0.25 μm or less.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to indicate the protruding distance of the tip ends of Yuasa et al is 0.25 μm or less.

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The rationale is as follows: One of ordinary skill in the art would have been motivated to indicate the protruding distance of the tip ends of Yuasa et al is 0.25 μm or less through an engineering routine lab experimentation and optimization that an ordinary skill in the art can pick and choose any distance which includes the distance of 0.25 μm or less in order to improve the reproducing sensitivity of the head. Additionally, it has been held that changes in size and shape of parts of an invention in the absence of an unexpected result involves routine skill in the art. See In re Dailey, 93 USPQ 47 (CCPA 1966).

Furthermore, Yuasa et al does not clearly disclose the protruding distance of the tips ends of the electrodes; however, Yuasa et al discloses there are 2 embodiment; wherein, the first one without the protruding distance and the second one with the protruding distance; therefore, it would have been obvious to one of ordinary skill in the art would have been motivated to pick and choose any distance from 0 μm or greater which includes the distance of 0.25 μm or less.

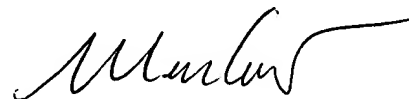
Response to Arguments

4. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen T. Cao whose telephone number is (571) 272-7569. The examiner can normally be reached on Mon - Thurs (7:30 - 6:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen Cao
Primary Examiner

AC
July 7, 2005